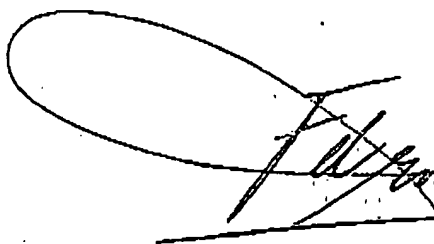



## CERTIFICATION

I, drs. F. de Groot, a sworn translator of Dutch nationality,  
of J. Boezerstraat 83, 2552 DL DEN HAAG, the Netherlands,  
do hereby declare that, to the best of my knowledge and belief, the  
attached translation prepared by me is a true and accurate  
translation of Swiss patent specification CH 405 851.

Signed this *28<sup>th</sup>* day of *November, 2005*

CMJ/MBX P53221US00

- translation of Swiss patent 405851 -

Title: Pressure reducing valve

The invention relates to a pressure reducing valve with coaxial, mutually aligned inlet and outlet connectors and a likewise coaxial control element formed as a rotational solid. Known pressure reducing valves of this type comprise relatively many component parts, and the object of the invention is to provide a particularly simple and economical design of such valves.

The valve according to the invention is characterized in that the control element consists of a bush, formed as a double-action piston, which at one end is closed with a cover part serving as valve closing part, while at the other end it is provided with a flange, whose surface is greater than that of the cover part.

In the drawing, an exemplary embodiment of the subject matter of the invention is represented in longitudinal section.

The housing of the pressure reducing valve represented has two flange parts 1 and 2 which are connected with each other through a set of screws 3 and clamp a cylindrical jacket 4 between them. The flange part 1 is provided with a central inlet connector 5 and the flange part 2 is provided with a central outlet connector 6, which connectors are disposed in mutual alignment in the axis of the housing and are provided with connecting thread 7 and 8, respectively.

The flange part 1 has, likewise located in the housing axis, an inwardly projecting, tubular extension 9, which is provided with an external thread 10, on which a nut 11 has been screwed. The nut 11 serves to adjust a pressure spring 12 which on one side rests on this nut 11 and on the other side rests on an outer flange 13 of a bush 14, serving as control element, which is arranged slidably in the tubular extension 9. The nut 11 is provided with a set of small holes 15, while the flange part 1 has at least

two diametrically opposed elongated slots 16, which have the same distance from the axis of the housing as the elongated slots 16 and which extend in circumferential direction through an arc, which is slightly greater than the circumferential distribution of the holes 15, so that when a hole 15 is at one end of the slot 16, another hole 15 is located at the other end of this slot. Thus it can be seen that with a pin, key or the like that is appropriate to engage in the holes 15, the nut 11 can be adjusted on the thread 10, through the slot 16.

The bush 14 is closed at the lower end thereof by a cover part 17, which forms the valve body and in the closing condition, via a ring sealing 18, rests on a shoulder 19 of the inlet connector 5, forming the valve seat. The shoulder 19 is situated at the lower end of a ring-shaped recess 20, out of which the water can flow through openings 21 radially into the lower end of bush 14. The bush 14 is sealed at the upper end of the tubular extension 9 by means of a sealing 22 against this extension 9. Further, the flange 13 of the bush 14 is sealed against the jacket 4 through a sealing 23.

The bush 14, representing a double-action piston, is acted upon from below in upward direction by the pressure of the water (e.g. approximately 8 atm. exc. pr.) entering the inlet connector 5 on the cover part 17, and from above in downward direction by the pressure of the water (e.g. approximately 4 atm. exc. pr.) flowing out of the outlet connector 6 on the flange 13, whose surface is substantially larger than that of the cover part 17. Further acting from below in upward direction is the pressure of spring 12 on the flange 13. It is clear that in operation the bush 14 sets itself such that the forces acting on it are in equilibrium. Then there is between the valve closing part 17 and valve seat 19 a narrow annular gap of a width corresponding to the desired pressure drop, it making no difference whether the sealing 18 is fixed on valve closing part 17 or on valve seat 19. When the bias of the spring 12 is increased, then on the outlet side a greater pressure must prevail to restore the equilibrium, i.e., a smaller pressure difference is

obtained. Of course, the valve can enter the closed condition shown only when the pressure on the inlet side falls, while the outlet pressure for some reason or other is maintained.

Clearly, as far as in the description and in the claims the expressions "above" and "below" are used, the assumption is that the valve is being considered in the position corresponding to the drawing.

### MAIN CLAIM

A pressure reducing valve with coaxial, mutually aligned inlet and outlet connectors and a likewise coaxial control element, formed as a rotational solid, characterized in that the control element consists of a bush (14), formed as a double-action piston, which at one end is closed with a cover part (17) serving as valve closing part, while at the other end it is provided with a flange (13), whose surface is greater than that of the cover part.

### SUBCLAIMS

1. A pressure reducing valve according to the main claim, characterized in that the bush (14) is sealingly slidable in an inwardly projecting, tubular extension (9), which at the lower end is provided with a ring-shaped recess (20), into which enters the liquid whose pressure is to be reduced, after passage between valve closing part (17) and associated valve seat (19), and out of which, through openings (21) provided at the lower end of the bush (14), it enters into the latter.

2. A pressure reducing valve according to subclaim 1, characterized in that the tubular extension (9) is externally provided with a thread (10), on which an adjustment nut (11) can be adjusted, whereby between the flange (13) of the bush (14) and this nut (11) a pressure spring is arranged.

3. A pressure reducing valve according to subclaim 2, characterized in that its housing comprises a flange part (1), which is provided with the inlet connector (5) and the tubular extension (9) and has holes (16) through which the adjustment nut (11) is adjustable.

4. A pressure reducing valve according to subclaim 3, characterized in that the outlet connector is provided on a second flange part (2), while between the two flange parts (1, 2) a cylindrical jacket (4) is arranged, relative to which the flange (13) of the bush (14) slides sealingly.